

What is claimed is:

1. An isolated immunostimulatory PTH-rP peptide comprising a fragment of the amino acid sequence of SEQ ID NO:1 or a functional variant thereof comprising one or more amino acid additions, substitutions or deletions.
- 5 2. The isolated PTH-rP peptide of claim 1, wherein the isolated peptide comprises an amino acid sequence selected from the group consisting of SEQ ID NO:2, SEQ ID NO:3, SEQ ID NO:4 and SEQ ID NO:5 or a functional variant thereof.
3. The peptide of claim 1 further comprising a helper epitope.
4. The peptide of claim 2 further comprising a helper epitope.
- 10 5. A multiepitope peptide comprising two or more PTH-rP peptides.
/
6. The multiepitope peptide of claim 5 wherein the PTH-rP peptides arranged in sequential, concatameric, or overlapping order.
7. The multiepitope peptide of claim 5, further comprising a helper epitope.
8. The multiepitope peptide of claim 5 wherein the two or more PTH-rP peptides are
15 selected from the group consisting of SEQ ID NO:2, SEQ ID NO:3, SEQ ID NO:4 and SEQ ID NO:5.

9. An isolated nucleic acid molecule encoding the PTH-rP peptide of claim 1 or 2.
10. An expression vector comprising the nucleic acid of claim 9.
11. A delivery vector comprising the expression vector of claim 10.
12. A virosome comprising the expression vector of 11.
- 5 13. A composition comprising a virosome encapsulating the PTH-rP peptide of claim 1.
14. A composition comprising a virosome encapsulating the PTH-rP peptide of claim 2, 5 or 8.
- 15 15. A composition comprising a virosome crosslinked to the PTH-rP peptide of claim 1.
- 16 16. A composition comprising a virosome crosslinked to the PTH-rP peptide of claim 2, 5 or 8.
17. A composition comprising a virosome encapsulating a nucleic acid comprising SEQ ID NO:9.
- 15 18. A kit comprising the PTH-rP peptide of claim 1 and instructions for use.

19. A kit comprising the PTH-rP peptide of claim 2 and instructions for use.

20. A method of generating T cells active against PTH-rP expressing tumors and metastases comprising stimulating T cells in the presence of antigen presenting cells that have been exposed to the PTH-rP peptides of claim 1 or 2.

5 21. The method of claim 16, wherein the antigen presenting cells have been infected with virosomes containing PTH-rP plasmids.

22. The method of claim 16, wherein the antigen presenting cells have been infected with virosomes encapsulating the PTH-rP peptides of claim 1 or 2.

10 23. The method of claim 16, wherein the antigen presenting cells have been infected by virosomes with the peptides of claim 1 or 2 crosslinked to the virosome surface.

24. A method of generating a T cell response specific for PTH-rP comprising immunizing a subject with the peptides of claims 1 or 2.

25. A method of inducing an immune response against tumors or metastases expressing PTH-rP comprising immunizing a subject with the compositions of claim 1 –13.

15 26. A method of treating PTH-rP expressing tumors and metastases comprising administering to a subject a therapeutically effective amount of the compositions of claims 1-13.

27. A method of immunizing subject against metastases and tumors comprising administering to a subject a therapeutically effective amount of the compositions of claims 1-13.

28. A method of preventing the occurrence or recurrence of PTH-rP expressing tumors or metastases comprising administering to a subject a therapeutically effective amount of
5 the compositions of claims 1-13.